

**Amendments to the claims:**

This listing of claims will replace all prior versions, and listings, of the claims in the application:

**Listing of the claims:**

1. (currently amended) An integrated electrofluidic system comprising:
  - a support platform including a plurality of laminated layers each comprised of a polymer material with a thin layer of adhesive;
  - an electronic control system mounted on said support platform;
  - a microfluidic system embedded in and formed by said plurality of laminated layers including: formed by processing said plurality of laminated layers to embed said microfluidic system thereon and for defining at least one electrofluidic component thereon;
    - an input and an output for receiving and dispensing a fluid, and
    - one or more in fluidic communication with said microfluidic system;
    - one or more at least one electrofluidic components component; said and
    - one or more electrofluidic components including at least one channel for providing
    - fluidic communication between said one or more electrofluidic components; and
    - at least one electrical conductor carried by said platform for electrically interconnecting said electronic control system and said one or more at least one electrofluidic components component.

2. The integrated electrofluidic system of claim 1 in which said platform includes a polyimide material.

3. The integrated electrofluidic system of claim 1 in which said platform includes KAPTON®.

4. The integrated electrofluidic system of claim 2 in which said layers are laminated using a phenolic resin adhesive.

5. The integrated electrofluidic system of claim 5 in which said phenolic resin adhesive is R/FLEX®.

6. The integrated electrofluidic system of claim 5 in which said phenolic resin adhesive is etched to a thickness of 3 to 10 µm.

7. The integrated electrofluidic system of claim 5 in which said phenolic resin adhesive is selectively removed from regions where bonding is undesirable between said layers and/or between a said layer and said electrofluidic component and/or a microfluidic component.

8. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a valve.

9. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a pump.

10. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a reservoir.

11. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a mixer.

12. The integrated electrofluidic system of claim 1 in which said microfluidic system includes at least one channel.

13. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a filter.

14. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a dispenser.

15. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a reactor.

16. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a heater.
17. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a concentrator.
18. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a pressurizing device.
19. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a cooling device.
20. The integrated electrofluidic system of claim 1 further including a sensor device integrated with said microfluidic system.
21. The integrated electrofluidic system of claim 21 in which said sensor device is embedded in said platform.
22. The integrated electrofluidic system of claim 21 in which said sensor device includes a flexure plate wave sensor.
23. The integrated electrofluidic system of claim 21 in which said sensor device includes a photoelectric sensor device.

24. The integrated electrofluidic system of claim 21 in which said sensor device includes an optical sensor device.

25. The integrated electrofluidic system of claim 21 in which said sensor device includes an electrochemical sensor device.

26. The integrated electrofluidic system of claim 21 in which said sensor device includes a temperature sensor device.

27. The integrated electrofluidic system of claim 21 in which said sensor device includes a pressure sensor device.

28. The integrated electrofluidic system of claim 21 in which said sensor device includes a flow sensor device.

29. The integrated electrofluidic system of claim 21 in which said sensor device includes a viscosity sensor device.

30. The integrated electrofluidic system of claim 21 in which said sensor device includes a mass sensor device.

31. The integrated electrofluidic system of claim 21 in which said sensor device includes a magnetic sensor device.

32. The integrated electrofluidic system of claim 21 in which said sensor device includes an acoustic sensor device.

33. The integrated electrofluidic system of claim 1 further including a dispenser device integrated with said microfluidic system.

34. The integrated electrofluidic system of claim 1 further including a heat exchange device integrated with said microfluidic system.

35. The integrated electrofluidic system of claim 34 in which said dispenser device includes a drug delivery device.

36. The integrated electrofluidic system of claim 1 further including a fuel cell device integrated with said microfluidic device.

37. (currently amended) An integrated electrofluidic system comprising:  
a support platform including a plurality of laminated layers; each  
comprised of a polymer material with a thin layer of adhesive;  
an electronic control system mounted on said support platform;

a microfluidic system ~~embedded in and formed by said plurality of laminated layers including:~~ formed by processing said plurality of laminated layers to embed said microfluidic system thereon and for defining at least one electrofluidic component thereon;

an input and an output in fluidic communication with said microfluidic system; ~~for receiving and dispensing a fluid, and~~  
~~one or more~~ at least one electrofluidic components; component ~~at least one electrofluidic component; said and one or more electrofluidic components including at least one channel for providing fluidic communication between said one or more electrofluidic components;~~

at least one electrical conductor carried by said platform for electrically interconnecting said electronic control system and said ~~one or more~~ at least one electrofluidic component components; and

a sensor integrated with said electrofluidic system.

38. The integrated electrofluidic system of claim 38 in which said platform includes a plurality of laminated layers forming said embedded microfluidic system.

39. (currently amended) An integrated electrofluidic system comprising:  
a support platform including a plurality of laminated layers; each comprised of a polymer material with a thin layer of adhesive;  
an electronic control system mounted on said support platform;

a microfluidic system ~~embedded in and formed by said plurality of~~  
~~laminated layers including: formed by processing said plurality of laminated layers to~~  
~~embed said microfluidic system thereon and for defining at least one electrofluidic~~  
~~component thereon;~~

~~an input and an output for receiving and dispensing a fluid, and~~  
~~one or more at least one electrofluidic components, component; said and~~  
~~one or more electrofluidic components including at least one channel for providing~~  
~~fluidic communication between said one or more electrofluidic components;~~

~~at least one electrical conductor carried by said platform for electrically~~  
~~interconnecting said electronic control system and said at least one one or more~~  
~~electrofluidic component components; and~~

~~a dispenser device integrated said electrofluidic system.~~

40. The integrated electrofluidic system of claim 40 in which said platform includes a plurality of laminated layers forming said embedded microfluidic system.

41. The integrated electrofluidic system of claim 40 in which said dispensing device dispenses fluid in the range of about 100 microliters to 100 picoliters.

42. The integrated electrofluidic system of claim 40 in which said dispensing device dispenses fluid at a rate of about 0.1 to 100 microliters/min.

43. (currently amended) An integrated electrofluidic system comprising:

a support platform including a plurality of laminated layers; each  
comprised of a polymer material with a thin layer of adhesive;  
an electronic control system mounted on said support platform;  
a microfluidic system ~~embedded in and formed by said plurality of~~  
~~laminated layers including:~~ formed by processing said plurality of laminated layers to  
embed said microfluidic system thereon and for defining at least one electrofluidic  
component thereon;  
an input and an output ~~for receiving and dispensing a fluid, and~~  
~~one or more at least one electrofluidic components; component; said and~~  
~~one or more electrofluidic components including at least one channel for providing~~  
~~fluidic communication between said one or more electrofluidic components~~  
at least one electrical conductor carried by said platform for electrically  
interconnecting said electronic control system and said ~~at least one one or more at least~~  
~~one electrofluidic component components; and~~  
a heat exchange device integrated with said electrofluidic system.

44. The integrated electrofluidic system of claim 43 in which said platform  
includes a plurality of laminated layers forming said embedded microfluidic system.

45-65.. (cancelled).